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BY

WALTER VAUGHAN, M.D.

PHYSICIAN AT ROCHESTER,

K E N T.

PRINTED BY W. GILLMAN,

ROC H E S T E R ;

SOLD BY THE ROBINSONS,

Pater-Noster-Row,

L O N D O N .

[M, DCC, XCII.]



to
DR. J. E. SMITH,
PRESIDENT
OF THE
LINNEAN SOCIETY,
FELLOW
OF THE
ROYAL SOCIETY, &c.

Dear Sir,

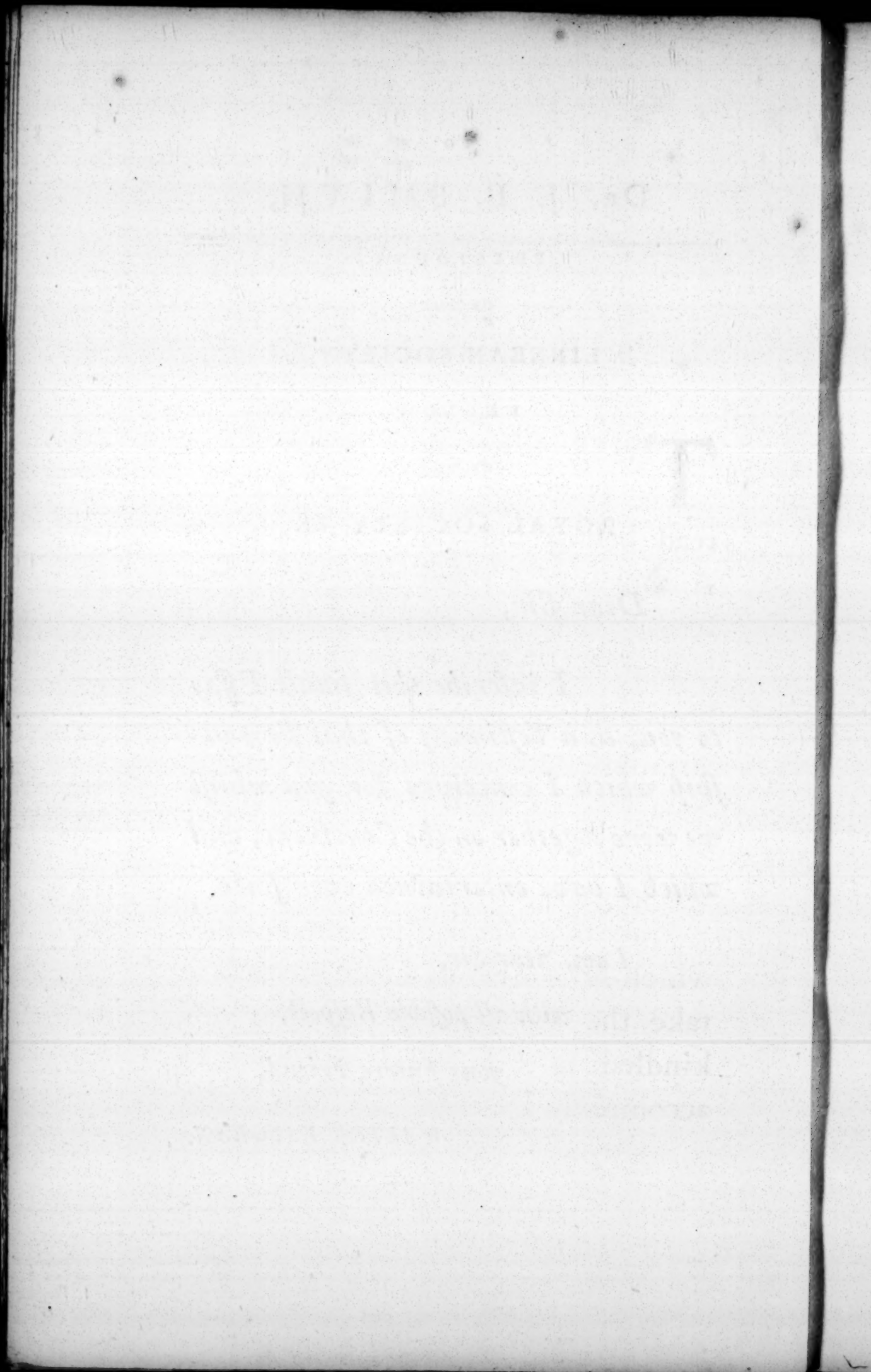
*I inscribe this small Essay
to you, as a Testimony of that Friend-
ship which I conceived for you whilst
we were together on the Continent, and
which I have entertained ever since.*

I am, dear Sir,

with all possible Respect,

your sincere Friend,

WALTER VAUGHAN.



P R E F A C E.

THIS Essay was begun some Years ago, and intended to be read before a Society of which the Author was a President. But conscious that to make a deep and lasting Impression on his Hearers both Brevity and Method were necessary, and judging himself inadequate to either, he desisted, laid aside the little he had written, and changed the Subject for another.

Since that Time, the same Motive, which first instigated him to undertake the Task, have frequently re-kindled in his Mind a Desire to accomplish it: and he hopes the

Delay which has of Course increased his Experience, has enabled him to think with some Precision, and to write with some Clearness and Conciseness.

It is true, to stem the Torrent of Custom supposes an Assurance which the World may not readily commend. An Assurance which from the known Inefficacy of the elaborate and polished Treatises of Winslow and Camper, some may call by the harsh Name of Temerity. But however bold the Author of this Essay may be judged, he dares to say he shall not be accounted licentious. He has not opposed Custom only because it is Custom ; nor has he darkened the Prospects of the well-inclined with gloomy Reflexions on human Calamities. But if after weighing the
Authority

Authority of Custom in the Scales of Reason he has found that such Custom is wrongly and unfortunately imposed on Mankind, he thinks the Votaries to Fashion can make no real Complaint against him for detecting and exposing the Imposition.

Presuming not to dictate his Sentiments to any; he only wishes to announce them. And that Politeness which should always prevail in discussing popular Topics, he has carefully endeavoured not to violate. This he did the more intentionally, because he thought it might contribute to secure the Efficacy of his Instructions, and to invalidate the Prejudices of the extravagant and thoughtless.

In

In a Word, intent on the great Duties of his Office, studious to improve those Talents which may render him useful in Society, and convinced that the Cause of Virtue is closely connected with the Object of his present Essay, he makes it public with the same Cheerfulness that he sat down to write it.

WALTER VAUGHAN.

ROCHESTER,
Oct. 11, 1791.

C O N T E N T S.

C O N T E N T S.

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PREFACE.

NON UT LAUDEMUR, SED UT PROSIMUS.

AN

THE Reader is requested to make the following Corrections before he begins to read this little Essay. For some of them greatly affect the Author's Sense and Intention, and others easily seen at first Sight render the Perusal tedious and disagreeable, if not timely attended to.

As to Omissions and Errors in Punctuation, which depend partly upon the Printer and partly upon the Author, a few are here pointed out, and the rest his candid Reader will supply and pardon; well knowing the Impossibility of a medical Man's regular Attendance on the Press.

E R R A T A.

Page		Line
8,	from the Top	3, After <i>Anatomy</i> , a Mark of Admiration !
13,		5, Instead of <i>erect</i> , read <i>steady</i> .
16,		6, After <i>Seemblance</i> , omit the Comma ,
24,	Bottom	9, Omit <i>doubtless</i> .
25,		11, Omit <i>now-a-day</i>
27,	Top	6, Instead of <i>bat</i> , read <i>that</i> .
40,	Bottom	9, Instead of <i>Axillæ</i> , read <i>Axillæ</i> .
41,	Top	7, Instead of <i>lasts</i> and <i>is</i> , read <i>last</i> and <i>are</i> .
47,	Bottom	12, Instead of <i>Solicitudin expem</i> , read <i>Solicitudine Opem</i> .
50,	Top	15, Instead of <i>sujet</i> , read <i>subject</i> .
54,		12, Instead of <i>Lie</i> , read <i>Life</i> .
57,		8, Instead of <i>agreeable</i> , read <i>agreeably</i> .
61,		10, Instead of <i>Elbowes</i> , read <i>Elbow</i> .
65,		2, After <i>them</i> , put a Comma ,
68,		11, Instead of <i>generall ymade</i> , read <i>generally made</i>
78,		7, Instead of <i>into</i> , read <i>to</i> .
87,	The Asterisk in this Page refers to this Note, which was overlooked, viz. * <i>Hoffmanni Systema Med. rationalis. Sect. I. Prolegomena de Februm Natura in Genere. § VII.</i> Dr. Lind thinks the Patient's Life in the greatest Danger from the hot Fit (Advice to Europeans, App. p. 313.): but I am inclined to believe Hoffman.	
88,	Bottom	6, Instead of <i>weakness</i> read <i>weakens</i> , and instead of <i>inebrating</i> read <i>inebriating</i> .
90,	Top	4, Let the following Words be inclosed betwixt Commas—, when the Air is dry ,
92,		12, Omit <i>are</i> .
103,		4, Instead of <i>uncomfortably warm</i> , read <i>uncomfortable</i> .
106,		4, Put an Asterisk, and another at the Bottom of the Page, with this Note—* Exposition of the Principles of Anatomy and Physiology, &c. Vol. II. Note 355, by the Author.
109,	Bottom	5, After <i>about</i> , put a Comma instead of a Colon
112,	Top	11, After <i>Smell</i> , put a Mark of Interrogation ?
114,		6, Let the following Words be inclosed betwixt Commas—, between the Toes ,

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C H A P. I.

INTRODUCTION.

Design of the Whole.

IT is an Observation easily made every Day that Man considers those Things the least of all, which from their Relation to him he ought to consider the most; and that many Evils of which he constantly complains are such as it is in his own Power easily to avoid. Thus, every reasonable Man must be aware of the little Attention which is generally given to the Nature of, and Manner of putting
B on,

his Clothes, as a possible Cause of embittering and shortening his Days. And there are, without Doubt, many other Causes of Complaint equally as effectual, though common and unheeded as this.

Far be it from me to derogate from those Professors of the healing Art, whom the Prince of Orators so long since likened unto Gods,* and whom the enlightened Part of the World, in every Country, even now hold in the greatest Estimation. I only say that, as it is the universally acknowledged Duty of medical Men to watch over the public Health and to avert every possible and probable Cause of Disease, it becomes them exclusively to distinguish Things salutary from such as are not, and to enter into familiar Explanations, as often as there is Occasion to convince Persons of the Impropriety and Danger of ill Habits. It is my humble Opinion, that however grave and important the oldest Physician may seem,

* *Nulla Re magis ad Deos accedunt quam Salutem Hominibus dando.*

CICERO.

he ought not to be offended at Persons, if they do not follow his Advice, when it consists only of a bare Assertion of the Infalubrity of Things, or of the bad Consequences of a Habit and a Desire or Command to abandon it. For unless Men be convinced that a Thing is wrong, it would certainly be supine and foolish for them to avoid and condemn it.

As for me, who have been somewhat instructed in the Principles of Medicine, with which I profess to be much delighted; and brought up in Hospitals, in which all acknowledge the healing Art to be exercised with most Simplicity and Success; I should judge myself deserving little of Mankind and acting a very dishonourable Part, if, convinced that Health and Life are frequently sacrificed to Dress I did not publish the Grounds of my Conviction to attract the Attention of those for whose Benefit I profess to practise.*

Is

* I confess, I feel the same Motives as the sagacious Sydenham may be supposed to have felt from these Words:
—“*quantacunque fuerint aliorum Conamina, semper existimavi*

Is not the Advice of Nurſes, and of Patients to one another often followed, whether good or bad, for no other evident Cauſe than their endeavour to eſtabliſh it by reaſoning? Is not this the Cauſe that Stay-Bands, ſwaddling Clothes, Rollers, and ſimilar Things are put about Children almoſt the Moment they begin to breathe? The Nurſe finds it irkſome to be continually watching the tender Infant; ſhe dreads the Labour of ſhifting its Clothes as often as ſhe ought, and of Courſe ſhe recommends thoſe which are ſo reſtrictive and heavy as to reſtrain its gentle Movements, and ſo cloſe and thick as to create and conceal Uncleanlineſs. It is natural that a Nurſe ſhould be leſs tender to the Child of another than of herſelf: and ſuch is the Depravity of many Nurſes, their inſatiable Thirſt after Cordials, their invincible Obſtinacy, and their unpardonable Confidence and Boldneſs, that I am

mibi vitalis Auræ Uſum fruſtra datum fore, niſi et ipſe in hoc Studio verſatus, ſymbolum aliquod, utcumque exiguum, in comune Medicinæ Ærarium contribuerim."

PRÆFATIO.

convinced

convinced Mankind would be really benefited by their total Abolition. Can any be so tender a Nurse to a Child as its Mother, to a Husband as his Wife, &c.?

But Custom must be regarded: and what one does from Craft and Knavery, another may be led to do from Humanity. So much does Example prevail over Precept.

I never knew a Nurse who administered *Opium* without the Knowledge and Direction of a Physician, and I have known numerous Instances of their administering it in Hospitals, who had not some plausible Reason to alledge as an Excuse. Even the Form of reasoning fascinates irresistably. I have more than once known the cogent Persuasions of an officious Nurse prevail over the express Orders of a visiting Apothecary: and I am sure that this is very often the Case among the common People, who deserve and have a Sort of Claim to the Attention of medical Men, as well from the Superiority of their Number as from their Poverty and Want of Knowledge. But
amongst

amongst Persons of Rank, Learning, and Ability, it may be taken as granted, that Truths however fairly stated, and Arguments however logically deduced, lose much of their Weight by being advanced by Men out of their proper Professions. So much is it incumbent on Physicians to study and inculcate what most conduces to Health, and that Constitution of our Bodies which is so necessary to the Enjoyment and Comforts, as well as to the Performance of the Duties of Life.

§ 1.

THE Design of this Essay, to speak plainly, is to investigate the Causes of Dress, to prove that the common Mode of clothing not only alters the natural Form of our Bodies, but also produces Inability, Disease, and Death; and to propose a Clothing suitable to every Age, Sex, Constitution, and Country.

My Reader will be greatly mistaken, indeed, if he imagine that I am about to educate such another Emilius and Sophia,
for

for each other, as Rousseau did. My Business is not with Education. The Trumpery of the Milliner, and the Apparatus of the Toilette are of no Concern to me. I care not how our Beaux and Belles dress, provided they do not thereby disqualify themselves for the Duties of human Society. I proceed, therefore, to lay down certain Premises.

§ 2.

FIRST, I think it indisputable that the Form and Structure of Man, as well as of every other Animal, are by Nature adapted to his Rank in the Creation. And to confirm this chief of my Premises, I will consider—the erect Position of Man—the Magnitude of his Brain, and its Proportion to the Organs of Sense, and—the Wisdom of Almighty God as it is manifested in his other Works and declared in the holy Scriptures.

A. Man is the only Animal that walks erect by Nature. Moscati has nevertheless asserted that Man does not walk erect

erect by Nature, but by Art. He thinks, or would be thought to think, that he can prove this Assertion by Anatomy. Surely, it will be exclaimed—“ *Nihil tam absurdum dici potest quod non aliquis Philosophorum excogitaverit.*”—But to descend into particulars: Moscati has properly enough defined that to be the natural Position of every Animal, in which it is most healthy, stands most firmly, and is best fitted for Motion of various Kinds. Let us see then by what Train of Arguments he was led to believe, and assert, and set about proving, that Man gains no Advantages from being erect, and that his most natural Position is horizontal.

He adduces Instances of Men who walked upon their Hands and Feet; and that all Men ought to walk so too, he infers from a Body being firmer which is supported by four than by only two Props.—Now, admitting that there have been Men who walked on their Hands and Feet; it does not follow from thence that a horizontal Position was natural to them.

them. The Universality of a Thing is not done away by the Evidence of a few Exceptions. Besides, no Animal, except Man, has two Hands and two Feet: Apes having four Hands,* and other Animals of the Class *Mammalia* having four Feet.

Again, it is shewn, I think, that the Arms were not designed to support the Body, by their being shorter than the Legs. It is objected by this Philosopher of Milan, that the Length of Bones depends upon the Use made of them; and that the Proportion of them is destroyed by the erect Position. But this Objection so pompously obtruded, rests upon a most slippery Foundation: ingenious it certainly is, but it is arbitrary in the extreme: for there is a remarkable Difference between the anterior and posterior Extremities of most Animals which constantly

* If the Reader will take the Trouble to consult the *Systema Naturæ* of Linné enlarged and improved by Joh. Frid. Gmelin, and published at Lipsic, 1788, by Emanuel Beer, he will find under the Class *Primates* many Observations to prove that the *Simiæ*, or Apes, were never intended to walk erect. The Observations are chiefly derived from comparing the Bones and Muscles.

go, as it is common to say, *on all fours*. For what Reason then are the Arms shorter than the Legs, unless it be natural for them to be so? How can the Arms become longer by being used as Legs!—And are Fingers made so beautiful, and endowed with so exquisite a Sense of feeling for the Purpose of treading the Ground! It does not seem likely: for the Cuticle is so soon thickened by Pressure, as we are taught by the Hands of Blacksmiths, that the Nerves which end in the *Papillae* of the Skin at the Tips of the Fingers would be so secluded by it from tangible Bodies, as to be altogether useless, or at least so incapacitated for the nice Distinction of Qualities as to deprive us of that Variety of Pleasure and Information of which Touch is so inexhaustible a Source. Where Nature intended that the Cuticle should be thick and hard, there she has made it so herself, as on the Soles of the Feet of Infants that have never walked.

Another Assertion of Moscati is that when an Animal goes on four Legs it is not so subject to Fatigue, as if it went only
on

on two. He says that many Muscles are continually acting to preserve our Bodies upright, to move us from one Place to another, and to keep our Heads steady ; but that Animals going horizontal, having their Heads merely fixed to their Necks, and moving alternately one anterior and one posterior Extremity, always, however, resting on two, do not incur Fatigue of the Muscles.—Now this, plausible as it appears at first Sight, will be found upon Examination to be more seducing than solid.

Circumscribed in my View, I will not attempt to prove how exactly and wonderfully the human Skeleton is formed for Motion according to the Laws of Mathematics. I wish, I could even dispense with such Terms as are likely to be thought difficult by the commonest People that may read my Book. As such Terms, however, must be either expressed or implied, I will use them as seldom as possible ; and try rather to convey my Meaning by familiar Examples than by abstract Reasoning.

Whoever reflects that the human Skeleton consists more especially of long cylindrical Bones, joined at their Extremities one to another, retained over one another like Pillars, and yet not bearing perpendicularly one upon another, will see, it is plain, without my proceeding, that our Body is kept erect by the Intervention of particular Means. The mere Skeleton of a Man can never remain erect of itself. The Joints must be connected by Ligaments; and Muscles and their Appendages are necessary to move and determine the Degree and Manner of their Movement.

The Influence of the Mind is conveyed by the Nerves into the Muscles; and hence it is that the *voluntary* Actions of the Body are performed. The Bones could not be moved but for the Muscles. As to their Connection by Ligaments, it alone could not preserve the Body erect. We should be perpetually falling, as well from the Slipperiness of the Cartilages which cover the Ends of the Bones as from our being incapable of quickly adapting

adapting the Line of Gravitation to the casual Inclinations of the Body.

Bodies always fall where the Line of Gravitation or of Innixion tends. A Man cannot stand upright and erect, unless the Line of Gravitation be within the Base of his Body; unless the Line of Gravitation fall between his Feet, or upon one of his Feet. For, although we frequently do stand upon the Heel or Toe of one Foot, the Line of Gravitation or Propension falling within the Bounds of the Heel or Toe; yet, even the Action of the Heart or Respiration would incline us to fall by throwing the Line of Propension out of the Base, if the Muscles were not excited by the Will to throw it as quickly in again.

In a Word, every Man of common Observation must know that it is easier to stand on one Foot than on both, changing the Foot alternately, and consequently giving alternate Action and Rest to the Muscles. But does not a Man stand and walk as firmly on two Legs as Animals on four? I confess, I have always thought so.

10. “ *Frustra fit per plura quod fieri potest per pauciora.* If the Stability of our Body be the greater in Proportion as the Number of its Supports is the greater, it may be asked, why we do not stand on our Heads too ! Why should we walk on our Hands and Feet, if our Feet alone are sufficient ?

How the Centre of Gravity of our Bodies is thrown forwards in walking, how the hinder Limb is lengthened, its Toe pressed against the Ground, its Heel raised, &c. in short, how walking, running, &c. are performed, it is not necessary to describe at present. But whoever considers the Strength of a Man’s Muscles, and that he has Clavicles, Buttocks, and Calves to his Legs, which no other Animal has except the Orang-Outang and Apes—which can walk erect like Man,*—whoever considers how the Shoulders of Man are kept at a Distance from each other by the Clavicles, while those of Brutes having no Clavicles almost touch,

* Linné’s *Systema Naturæ*, Edit. Gmelin.

will readily see that Man walks erect, without being more fatigued by it than Brutes by going horizontal.

As to an erect Position being a Cause of Disease, I think it easy to prove the contrary. I am of Opinion that the *Fætus in Utero* never changes its Position, but is always as at Birth. And if I were to admit that its Head is turned downwards and its Legs upwards, yet as Brutes must also be in a similar Position, I cannot believe, like Moscati, that the large Size of the Head of a *Fætus* and the small Size of its Legs depends upon it; and much less can I believe that a Tendency to Giddiness, Headache, Madness and Apoplexy are owing to the same Cause.

Palpitation of the Heart, and Aneurisms of it and the large Vessels near it, Inflammation of the Breast, Dropsy of the Breast, and pulmonary Consumption are derived by Moscati from a Change in the Situation of the Heart; which, he thinks, is caused by the erect Position, because in a *Fætus* the Heart is, as it is in Brutes, nearly perpendicular.—But this Argument

ment is of no Weight, since the posterior Surface of the Heart of a *Fætus* is flattened by Nature, as if to prepare it for resting upon the tendinous Part of the Diaphragm. Besides, it might be affirmed, with much greater Semblance, of Truth, that many other Differences between the *Fætus* and Adult depend on accidental Causes, which we are nevertheless convinced do depend on natural Causes, because they are observed in four-footed Animals.

Hypochondriacism, Piles, Ruptures, *Varices*, Dropsy, and many other Diseases, he attributes to the *Viscera* of the *Abdomen* pressing downwards upon the Contents of the *Pelvis*. *Prolapsus Ani et Uteri*, Costiveness and Abortion, he also assigns to the erect Position; and says that the last is most frequent in the human Species!—Alas! if Moscati had considered the Position of the Diaphragm, the Yielding of the Abdominal Muscles, and how by the Obliquity of the Diaphragm the *Viscera* are forced forwards and not downwards—a Subject which I shall speak more fully of anon (§ 12.—F.)
if

if he had considered the Course of the Absorbents and their Termination in the Angles formed by the subclavian and jugular Veins, he must have discovered his Error. I am deceived if there be not something in the human Face which proves that it was intended to look towards Heaven.

*Prona dum spectant Animantia cætera Terram
Os Homini sublime dedit Cælumque tueri
Jussit et erectos ad Sidera tollere Vultus.*

Having thus, I hope, effectually overturned the principal Paradoxes of Moscati, respecting the Position of Man's Body, I come to speak of the human Brain and Nerves, to show how by the Consideration of them the Fact alledged above (§ 2.) may be corroborated.

B. Should it be granted that the internal Structure as well as the external Form of Man are adapted by Nature to his Rank in the Creation, will it not be extremely probable that Peculiarities in Individuals are connected with Peculiarities of intellectual Powers, somewhat like Cause and Effect? I profess, I think

D

so:

so: and though I have not long studied, as some may have done, the Science and Practice of Physiognomy, and am not prone to recur in any degree to mysterious Explications, yet I have more than once guessed, and guessed successfully, the Disposition of a Man from a slight Glance at his Features. I am inclined to suppose him, whose Face is like that of a Dog or an Owl, to have also a correspondent Disposition.

My Reader has probably not Time to spare, and I want both Ability and Inclination to keep his Attention and good Nature towards me alive by a long Dissertation. Be the Seat of the Soul where it may:—I have chosen to instance the Brain of Man to prove by it how greatly the internal Structure of Animals differs, and how much more complex the Structure of Man is than that of any other Animal. But to descant on the Magnitude of the human Brain, its Proportion to the Organs of Sense, and the Connection between this Proportion and the mental Powers, would be a Work, in this Place,

Place, of Supererrogation. It must at least be allowed that it is for some wise Purpose that the human Brain differs from that of every other Animal: for if Man were designed for no particular End, he might certainly have been formed like Brutes. In short, I have no Doubt but that the internal Structure of Man's Brain, as well as the Form of his Face, are somehow connected with his Disposition.

The great Morgagni, who dissected the Bodies of maniacal Patients, observed that the medullary Substance of their Brains was drier, harder, and firmer than that of the Brains of others. And Professor Meckel has said, in one of the Berlin Memoirs, that he found the Brain not only drier, but specifically lighter in the Bodies of insane Persons. It must not be forgotten, however, that Morgagni and others sometimes saw the Brain soft in one Part and hard in another. To me it is very likely that whenever the internal Senses are disordered, a proportional Disorder of the Brain also exists; and I

have frequently thought, and do even now think, that the State of the human Brain in some Diseases becomes like that of certain Brutes in Health.

But I would not be thought to believe that Sensation arises from mere Organization. I do, indeed, believe that it cannot exist without it. But my Opinion is that the same Organization often remains after Death, and therefore that something must be superadded to Organization, to make it produce Sensation and Thought. What that Something is nobody knows: we call it the vital Principle: in the Scriptures it is perhaps called the *Breath of Life*.

Now, let me ask my Reader, whether he believes with me, that there is one Organization of Man and another Organization proper to every Race of Animals? Whether he believes with me that every Man has a Peculiarity of Organization by which he is more or less fitted for Sensation and Reflection?

C. For the last Proof (§ 2.) I had resolved to consult the Bible, in which it is
said

faid that God created Man after his own Image. But I defist, becaufe I cannot pretend to aspire to, and fupport as I would, that Character which gives Authority and Dignity to theological Tenets. Therefore, if my Reader do not agree with me that for the vifible Image of an invifible, incomprehenfible, and incomparable God a peculiar and moft excellent Structure and Organization are neceffary, I openly acknowledge that I fhall not be difappointed, if he believe not one Argument that I am about to offer.

§ 3.

I SHALL now endeavour to prove that the Notions which we have of the Proportions and Beauty of the human Body are arbitrary and fanciful. This is a fecond Premifs.

If it be granted that every Man has naturally a peculiar Organization, and is thereby fufceptible of certain definitive Degrees of Exertion, it follows that every Alteration of Organization muft tend to
alter

alter the Susceptibility—to increase or to diminish it. That Mankind have no settled Rules for judging the Proportion and Beauty of one another, I infer from considering the following Facts, *viz.*

A. That not only the Individuals of different Nations and of different Ages, but also the Individuals of any one Nation and of any one Age, differ in their Tastes of Beauty.

B. That in all civilized Nations particular People endeavour, in some Manner, to vary their Proportions, let them be naturally what they may.

C. That the Painters and Statuaries most versed in the Art of designing agree that the Excellence of a Picture or Statue is more certainly proved by the Impression it makes upon the Senses than by comparing its several Dimensions.

D. That the Dimensions of two Bodies, or of the two Sides of one Body, are never exactly similar.

E. That Nature never united Parts so proportioned one to another as those which
form

form the Assemblage at Rhodes called *Apollo*, or the *Venus de Medicis* :—

“ Two faultless Monsters which the World ne’er saw.”

§ 4.

PREMISES (§ 2. and 3.) being thus established, I leave it for my Reader to estimate the Audacity and Folly of those who are always intent on altering their Shape and Appearance; as if any Deformity which the Capriciousness of the Age gives Rise to were more becoming and delightful than the Works of our omnipotent Creator. In the next Part of my Essay I shall undertake to prove that Clothes, which are necessary to defend us from the Inclemencies and Vicissitudes of Climate and Season, and to hide those Parts which Delicacy and the Interests of Society require to be hidden, by being worn agreeably to the present Fashion incapacitate us for our Duties as Members of Society, create Distress and Disease, and are in Truth the most insidious Instruments of self-destruction.

It

It may be imagined, that what I shall presently pronounce, is more applicable to the fair Sex. Nay, if I may judge from the Conversation which I have casually had, I am expected to rant on tight Stays, and to repeat in short, energetic and poignant Language, all the common-place Reflections which have transpired from splenetic Writers.—But I shall purposely avoid such mean Invective. It has always been known that Men and Women are naturally attracted by each other; and it is almost certain that if those Women who lace tightly from a Desire to please Men, had found by Experience that instead of rendering themselves more lovely, they were more disliked, they would doubtless have remained content as Nature made them: so that the Fault is more in Men than in Women.

Nor will I refer Abuses in Clothing to the vulgar and illiterate: for they are far more general among the rich, the polished and the well-informed; constituting a principal Part in the luxurious Parade of
Wealth

Wealth and Distinction. How often have I been grieved that such Evils should be every Day so much practised by those whose Example is likely to betray thousands, and reduce them to Poverty and Distress !

——— *Tanta est quaerendi Cura Decoris.*

I thought some Years ago that the most effectual Method of preventing young People from being so enamoured of fine Clothes, would be for their Parents to inculcate that native Charms alone constitute Beauty, and that very few are handsome enough to wear plain Clothes. But though I am persuaded this Method would now-a-day be advantageous, yet recollecting that in this Age the Number of old Women is less than perhaps in any preceding one, I do not insist on it

The justly celebrated Buffon says Fashion is rational, when it is intended to lessen and conceal Defects and Blemishes. But, if by this, he would be understood literally, I do not see when Fashion is not rational, in the same Sense. I rather think he intended to call this

E

Fashion

Fashion justifiable. If this Conjecture be admitted, and I think, they who read his *Histoire Naturelle* cannot but admit it, it will be supposed that he thought Reality should be no Part of the Concern of a deformed Lady or Gentleman, and that thus he was giving them a fine Lesson of Hypocrisy.—Now, as they who disguise their Persons may justly be supposed to disguise their Sentiments, I will try to confute the Count de Buffon partly from his own Words and partly from those Premises which I flatter myself I have already obtained my Reader's Assent to. The Count says that, taking Mankind in general, there is a greater Number of deformed than of well-proportioned Bodies, and a greater Number of ugly than of pretty Faces.—Now, I admit these Assertions, not because I believe them, but because I cannot prove in what the Proportion and Beauty of the human Body consist, and, therefore, I deny that any Fashion whatever can be founded on Disproportion and Ugliness. For Fashion, in the Sense that I have
been

been used to understand and employ the Word, implies something approved and established by the Custom of many. But Deformities of Body and Face are seldom or never seen exactly alike ; so that the Means of concealing them can never be established by the Custom of many ; every individual, on the Count de Buffon's Principles, would clothe himself differently according to the Seat and Complexion of his Deformity !

“ *Spectatum admissi, Risum teneatis Amici !* ”

What a motley Appearance we should make, if we were all clothed *rationaly*, according to Buffon's Opinion : if every one of us were to cover his supposed Defects and Blemishes, and to expose his supposed Beauties and Excellencies ! What Reason is there in Disguise ?

Let us, however, suppose Fashions dictated by the deformed, because the greater Number of Mankind is deformed. Would it not reduce even those who are not deformed to the hard Lot of dressing as if they were ? I fancy it would : for if those only wore great Coats whom little

Coats would betray, Mankind would be distinguished into two Classes, in every Town. The obvious Consequence of which would be, as Beauty is more estimable than Deformity, that they who accustomed themselves to wear great Coats would be disliked, and that they who once put them on to defend themselves against Inclemencies of Weather, would now either lay them totally aside, or else only wear them on the most urging Occasions, lest they should be accounted deformed.

Men of a sound Understanding can often tell the Emotions of the Soul by external Signs. These Signs were formerly sought after in the Features of the Face: they are now looked for as much in the Costliness of one's Apparel. Alas! if our venerable Ancestors were but raised from the Dead to see their Posterity disguised so hideously with Paint, Powder, and several other Articles of Dress, they might be led to ask—

“ Where is a Man ? ”

I do

I do not mean to say that Fashions have not originated from the Blemishes of Individuals in Power. I know they have. But I deny that any Man's having a Blemish and using Means to hide it, is a sufficient Cause for my using the same Means who have not that Blemish.

The plain Truth is, that Refinement teaches Men to dislike every Thing natural, fits them only to disguise, and disqualifies them for assuming with a manly and a liberal Air that Character which alone is truly great.

C H A P. II.

Concerning the Effects of modern Clothing.

WHILST I was engaged in establishing on the firmest Foundation the Premises fit for a pleasant and useful Superstructure, such as I hope my Reader will deem the present Performance, I endeavoured with all the Ability I could, not only to deduce the Superiority of Man over all other Animals from the Excellence of his Sensation, the Form of his Body, especially his Limbs, and the Freedom of his Motion, but also the Superiority of one Man over another, as to Mind, from a short but argumentative Digression on the curious and intricate Structure of his Brain, and the Changes which it undergoes by Disease. Lastly,
I suggested

I suggested some Hints on the comparative Physiognomy of Man and Brutes, and professed a Belief that the Organization of the Brain, the Operations of the Mind and the Lineaments of the Face, are naturally and inseparably connected with one another. I now come to show how Clothing may be a Cause of Distress, Inability, Disease and Death.

In conducting this Part of my Essay, there are two Methods which present themselves, the analytical and the synthetical: neither of which I can strictly abide by. But I prefer the former, First, because it has paved the Way to so many important Discoveries in the Philosophy of Nature, and, Secondly, because by resolving Things into their constituent Parts so that each Part may be separately examined, it seems the better adapted to the Doctrine of Diseases in which we descend from considering morbid States in general, which is *Pathology*, to the Consideration of morbid States in particular, which is *Nosology*.

§ 5.

CLOTHING may cause Distress, Inability, Disease and Death in two Ways, more particularly, *viz.*

1. When it is so fashioned and adapted as to compensate for supposed Defects, or to supply and augment imaginary Beauties.

2. When it is made of improper Materials through Necessity, or for the Sake of Ornament.

As for the Custom of confining the Limbs of Infants with Rollers, and Things of the same Kind, it is now growing obsolete. People have some Time since found that Deformity and Lameness are induced by it, and the Bills of Mortality show that Deaths are far less frequent in Infancy now than they were formerly. What Motives there could ever have been for Mothers to lay a Restraint on the Motions of their Infants, it is not easy to say. But why Nurses are fond of swathing

F Infants,

Infants, it is easy to say : it is that they may be deterred from moving their Limbs by feeling an Uneasiness in attempting it. For this Inaction and Constraint which limits the Suppleness of their Articulations, renders the Eye of the Nurse less necessary, and affords her an Opportunity of more frequently satiating those brutal Appetites which Nurses are so infamous for : Tippling and Junketing.

§ 6.

I PROCEED to consider each of the two Ways noticed above, beginning as it is most consonant to method with the former. If Clothing be so made by the Artist and so put on by the Wearer as to lessen or conceal supposed Defects and Blemishes ; or to increase or add imaginary Beauties, it is plain that the Object of both Artist and Wearer is either to have them so small as to compress, or so large as by retaining a certain Quantity of Wadding to fill up Hollows, and thus to
render

render the Proportions and Symmetry of the Body apparently real and natural.

The Time then is now come, in which I must call my Reader's Attention to the Influence of too small and too large Clothes on the Structure and Faculties of the human Body. And as not only the Extremities but also the Trunk of the Body may be generally as well as partially compressed, I shall treat of them in both States.

It would be an Inquiry of the greatest Importance to investigate how far the Dress, and Implements of Labourers in the several Manufactories are capable of influencing them; and how Soldiers who are frequently obliged to bear Arms, and to carry great Burthens, may be enabled to do so, with the least possible Fatigue. And should I ever find myself inclined to resume my Pen on this Subject, the present Essay shall be considered as introductory to such an Inquiry.

§ 7.

As to Clothes made too small,
the superior Extremities, or Arms, are subject to the most general Pressure from the Sleeves of Gowns and Coats, and to the most partial Pressure from the Hem of the Sleeves of Shifts and Gowns, Bracelets and the Wrist-Bands of Shirts, and the elastic Band and Buckle made to keep up Gloves :—

As to Clothes made too large,
the superior Extremities are seldom encumbered with any.

THINGSought to be thoroughly known before their Causes are inquired after: and I shall accordingly let History always precede Philosophy.

A. The most general Pressure to which the Arms are ever subjected by the tyrannical Laws of Dress is inflicted by the *Sleeves of the Gowns of Women*. These are made to extend almost, but not entirely, down to the Elbow.—Men seldom or never suffer such general Compression of
the

the Arms from the Smallness of the Sleeves of their Coats, because the Figure of their Arms is different from that of the Arms of Woman, owing to their Muscles being larger, and swelling more in Action, and to the Interstices between them not being so completely filled up with Fat. Every Man must be sensible of the Beauty which a Female derives from the Roundness and Smoothness of her Limbs, and the Softness and Whiteness of her Skin. Her *Nates* lose their Rotundity in Proportion as they lose their Fat: and Men complain of Pain and Uneasiness from sitting, when the Fat is wasted from their *Glutaei* Muscles. In Holland, where many Women labour as much as Men in England, it is very common to see their Arms like those of Men, with swelling Muscles, and without either Plumpness or Whiteness. Do not the Breasts of Women so white, exuberant and lovely by Nature, become disgustingly pendulous, Olive Coloured and flabby when they lose their Fat?

I wish

I wish, I could persuade my fair Country Women to bear with Patience that Complement of Fat allotted them by Providence. For it is certain, if they desire to be thin when they are fat, the very means of rendering themselves so, will inevitably rob them of that, which by distinguishing them from Men, renders them lovely, Smoothness and Whiteness of Skin. For Children who are generally fat, are generally fair: and when they become Women, and have made themselves thin by abstaining from Meat, by voraciously swallowing Bread, and by drinking Vinegar, or Things soaked in it, they lose their Plumpness, their Skin falls into Wrinkles, becomes dry and scaly, and acquires an Olive Colour.—But these are not all the Evils which attend those Ladies, who are desirous to lose their Fatness, and who damp their Appetite with Bread, to prevent their eating a proper Quantity of Meat: for even their Muscles grow small in consequence of this Regimen, and the Ends of their Bones becoming proportionably prominent, render their
 Appearance

Appearance altogether disagreeable, ghastly and unnatural. We may be sure that Nature does nothing without having in View the best and wisest Ends. The Truth of which I think is shown by her giving so much Fat to those whom we soon find labouring of morbid *Viscera*, of Consumption and Dropsy, when they have viciously freed themselves from it. Do we not every Day observe Females become suddenly thin from the Practices which I here reprobate, losing their Appetite or acquiring unnatural ones, labouring of Irregularities of the menstrual Discharge, and gradually sinking into Consumption, Dropsy, &c? Lean Persons are always the more sensible of Cold in Proportion as they are the more lean. How much more sensible of Cold then must they be who naturally fat have become lean?

The Arm of a Woman is by Nature somewhat taper from the Tip of her Shoulder, becoming smaller downwards to her Wrist; but that of a Man is always, or ought to be, largest a little below his Elbow. Hence, it appears why the Sleeves
of

of a Woman's Gown may compress generally, and why the Sleeves of a Man's Coat can only compress partially. I have a Coat now in my Possession, made so small in the Sleeves that if I grasp any Thing, whilst I wear it, I cannot hold it long; and if I grasp nothing, the Veins on the Backs of my Hands swell. I cannot write with it; for I cannot hold a Pen with proper Steadiness and Command: nor can I lean for a few Minutes only on my Desk without benumbing my Fingers. Now, if partial Compression below the Elbow can excite such Inability and Pain, what may not the general Compression of a Woman's Sleeves excite? The Compression in the *Axillæ*, which small Gown or Coat Sleeves occasion, may also be occasioned by the Use of Crutches.

I cannot omit to notice in this Place, the improper Application of a Machine very common for keeping the Shoulders of Children backwards, and for opening their Chests. This Machine is most commonly called, I believe, a *Back-Board*.

It

It is easy enough to fix it so as to stop the Pulsation at the Wrist; and as it is carelessly used, I dare to say it often has this Effect. And I am inclined to believe that the Weakness and Numbness in the Arms of some Children, which not unfrequently lasts through Life, is owing to the Pressure which the Shoulder Straps and Pads of this Instrument make upon the subclavian and axillary Artery.

I am inclined to believe that the Shortness and Smallness of some Arms depends on the early and long continued Application of this dangerous Instrument.

B. The *Ends of Shift or Gown Sleeves*, whether they be simple Hems, or Bands like the Wrist-Bands of a Shirt, may compress in a very great Degree: for they yield little, or not at all, when the Arms are moved. The Ends of Shift-Sleeves compress like the Ligature applied previous to Blood letting; and I have known them compress as much. Nay, I once knew a Woman come to be bled, whose Gown-Sleeve was so tight that the Blood

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could

could not be stopped till she was persuaded to cut it.

C. The *elastic Bands* and *Buttons* used to keep up Gloves are another Cause of Compression. The former, which is chiefly used by the Ladies, consists, I believe, of a Wire twisted spirally so as to possess great Elasticity, contained in a thin Cover of Silk. It almost always leaves an unseemly Indentation, and it frequently excites the same Effects as the small Sleeves of a Gentleman's Coat.—Buttons are seldom used by the Ladies, except those who ride. They compress the Wrist, weaken the Hand, and incline it to shake, just like tight Wrist-Bands.

D. *Tight Wrist-Bands* occasion a Fullness of the Veins on the Back of the Hand, Numbness, Weakness, &c. They are seldom however worn in such a Condition as to excite these Consequences, because they have no Relation to Beauty or Ornament.

E. *Bracelets* are generally fixed by Ladies over the styloid Process and small Head of the inferior Extremity of the
Ulna.

Ulna. They are less worn by fat than by thin Persons, because in the latter they serve to conceal, or to render less remarkable, the Ankle-like Projection. Their Effects are similar to those already mentioned.

F. *Rings* are now more common than ever. They seldom do any Harm: though I knew a peevish School-Mistress, whose Fingers being swollen in Consequence of her flapping a Boy on the Back, obliged her to have her Ring cut off with a File.

There are Exceptions to all general Rules; so that we can estimate Rules only according as there are more or fewer Exceptions to them. If I mistake not, large Clothes can neither injure the Functions nor alter the Form of the human Body, unless they contain a certain Quantity of Wadding. When they do this, the Wadding becomes a Compress and the Clothes a Ligature: so that not being engaged at present to regard the Quality of Clothes, we may refer the Instances of partial and general Wadding, as to

their Effects, to what has been already advanced.

§ 8.

As to Clothes made too small, *the inferior Extremities, or Thighs and Legs, are subject to the most general Pressure from elastic leathern Breeches, and tight Boots, and to the most partial Pressure from Garters, small Shoes and Buckles.*

MUCH of what was adduced relative to the Difference between the Arms of Women and those of Men is equally applicable to their Thighs. But besides the Largeness and Roundness of a Female's *Nates*, the *Trochanters* of the *Offa Femorum* are wider apart in Women than in Men. Hence it would be almost impossible for a Woman of Youth, Health, and good Proportions to wear the Breeches of a Man of the same Height, and of apparently the same Size.

A. The Compression of *tight leathern Breeches* however general, is not always equal.

equal. Every Man may have felt at some Time of his Life, a Numbness of one or both inferior Extremities, from sitting on a hard Seat. I have known the same induced to such a Degree by wearing a tight Pair of leathern Breeches, as to remain for many Hours after they were drawn off.—Elastic leathern Breeches frequently cause a Numbness and Coldness of the external Part of the Thighs and Hips, and are in my Opinion a very improper and injurious Article of Dress. They are certainly handsome, and very fit to expose a muscular Thigh; but they are inconvenient in Walking, and I heard a fellow Student once say that he never wore them without feeling a Numbness and Coldness of his Extremities, and a Pain and Sense of Weight in his *Testes*. I once felt the same myself, which has deterred me from wearing them ever since.

B. *Boots* made too small, and of thick hard Leather, are so pernicious to Health, and so disagreeable in Walking, that I wonder any sensible Being should confine himself in them, for the silly Purpose of showing

showing the exact Shape of his Legs. The Effects which they occasion may easily be understood from what I have said already, and from what is to be more fully explained hereafter. (§ 11.)

C. *Garters* are worn both above and below the Knee: but they are equally improper in both Places. They cause a disagreeable Appearance of the Part. They dispose the Legs to Dropsy, they render Walking tiresome, and they are a very common Cause, if I judge right, that many so often stumble, fall, and break their Knee Pans.

D. *Shoes and Buckles* I shall say nothing about, though all the World acknowledge the former to be a Cause of Corns and Lameness when too small. For Camper has treated very fully of them in a Work which I have never had an Opportunity to peruse.

§ 9.

Of the Pressure of Children's Caps, Fillets, &c.

I BELIEVE, the *Chin-Stay* is now so seldom used by our English Nurses, that
no

no one can doubt but the Head of an Englishman owes it Form to natural and not to artificial Causes. My medical Reader may recollect the famous Sentence of Vesalius in which he says that—
“ plerasque Nationes peculiare quid in Capitis Forma sibi vindicare constat. Genuensium namque, et magis adhuc Graecorum et Turcarum Capita Globi ferè imaginem exprimunt, ad hanc quoque, quam illorum non pauci elegantem et Capitis quibus variè utuntur Tegumentis accommodum censent, Obstetricibus nonnunquam magna Matrum Sollicitudin eopem ferentibus.” * But however desirous a Mother may be to give her Child's Head an unnatural Form, and however capable Midwives and Nurses may be of flattening the Skull, as the Indians of America do, and of causing similar slight Variations, I am convinced there is something in the Face and Head of a Negro, which no Art can imitate, obscure or supplant.

Why the figure of the Skull is so easily altered soon after Birth, may be account-

* *De Corp. hum. Fab. Edit. 1555.*

ed for from the Sutures being open, and the Spaces between them being filled only by *dura Mater* and *Pericranium*. For the Sutures remaining unossified till after Birth, that the Child's Head may be diminished, its Brain compressed, and perhaps an Insensibility of its whole Body induced, as it passes through the *Pelvis*; it is easy to be conceived that the Edges of the *Offa parietalia* may be forced over each other, or nearer each other, even after Birth, for a longer or shorter Time; so as to make the Head flat, or otherwise, as Fancy may dictate.

I am inclined to believe that there is no part of the human Body subject to so little artificial Alteration as the Face. There are perhaps Peculiarities in the Form of every Part of the Body, by which a curious Naturalist might distinguish the People of different Nations from one another: but all must allow that such native Differences are in no Part so constant and remarkable as in the Face. The Figure of the Skull may be changed by Art: but I am mistaken if that Character
stamped

stamped by the Hand of Nature in the human Face can ever be obliterated, or so much obscured as to prevent its being assigned to its proper Nation, without Reference to artificial Changes, or to the Colour of the Skin, the Hair, the Stature, &c. Small Eyes, thick Lips, and high Cheek-Bones are national Features, and they have never been assigned to Art. That the Skull which Mr. Cline shows of a Caribbee Indian should have been so much flattened without impairing his mental Faculties,—for he was skilled in Plants,—is a Circumstance which I do not presume to reason about, because we know so little of the Uses of the different Parts of the Brain.

But to quit this Digression, for I am not certain that the Skulls of Children are ever altered in Form by English Nurses, I cannot but express my Surprise that the celebrated Camper, Sabatier,* and others, should have denied the possibility of

* *Traité complet d'Anatomie. Tome I. p. 25.*

Journal de Physique. Avril. 1789.

changing the Figure of the Skull in Infancy. For I verily believe that many of the Diseases of Children depend on bad Management, that their Faculties are impaired, that the Suppleness of their Limbs is lessened, by the irrational Pressure of their Clothing, and that their frequent Deaths in the first and second Years of their Lives, are partly owing to the Hazards of Infancy and partly to the Prejudices of Midwives which dispose them to think their Ailments unavoidable and incurable.* When I recollect that Bones are subject to more changes than any other Parts of the Body, probably from the very circumstance of their Hardness; when I recollect that sound Bones are often removed by the Pressure of Tumors; when I recollect how they are affected by Aneurisms, how they are removed after Fractures, how their Particles are successively absorbed, and how they are imprinted by the Action of incumbent Muscles; I am obliged to differ from Cam-

* Grigg's Advice to the Female Sex.

per and Sabatier. I must also differ from Haller, who with as little Reason says—
*“ Si Offa et Dentes renovantur, si adeo vetusta Elementa delentur et nova iis succedant, de aliis Corporis Partibus minus firmis, non oportet dubitare.” **

To proceed. *A Cap*, or something like it, is fixed on the Heads of our Children soon after Birth, and made to bind the external Ear closer to the Skull than it was ever naturally intended. Mothers and Nurses think nothing more unbecoming an Infant than prominent Ears; and Ladies are in general so averse to them that they hide them as a Deformity. Nay, some Ladies hide their Ears how flat and close to the Head soever they be. The Absurdity of which, I think, I cannot better inculcate than by vindicating Nature's Intention, and by proving the Inconveniences which inevitably attend and follow so irrational an Attempt to supersede her. It is agreed by all that the external Ear, or that oval concave

* *Elementa Physiologiae. Tom. VIII. Pars II. p. 54.*

Cartilage which is affixed to the *Os temporale* on each Side of the Head, is intended to collect the Tremors excited by sonorous Bodies in the Air, and to convey them to the *Membrana Tympani*, or Drum of the Ear. The great Elasticity of this Cartilage proves its Use, as likewise do its numerous Eminences and Cavities which so accurately correspond with one another to receive the Rays of Sound, and to reflect them into the *Meatus auditorius*, or that Passage which leads to the *Tympanum*. Besides if this Cartilage be cut entirely off, Hearing is either greatly lessened or totally destroyed by it. Hearing is also lessened by flattening the Ears: and the Ear-Trumpet is in Reality nothing but an artificial external Ear.—Now, if all this be true, and my Reader must know that it is generally received as true; what Reason can induce us to flatten and conceal our Ears?

Nature seems to have made the human Ears moveable, like those of Dogs, Horses, &c. and for the same Reason too. If not, I ask why did she furnish them with
Muscles?

Muscles? For though the Number of the Muscles of the external Ear be different in different Subjects; yet, I believe, there never was a Subject in whom there were not some, as well belonging to the whole external Ear as to its several Parts. I am of the same Opinion as Albinus was, that —“ *Consuetudo et perpetuus Vittarum Usus Auriculas ad Caput apprimunt et immobiles reddunt.*”

To refute Reimarus, as I have Moscati, I am not at present inclined. I deny however that the Senses of Brutes are more acute than those of Men, and that Brutes have Senses which Men know nothing of. Let Reimarus, or his Admirers prove the contrary, if they can.

§ 10.

Of the Compression of Collars, Neck-Laces, Stocks, &c.

T H A T Pressure on the Neck is often hurtful in the fashionable World, and is sometimes fatal, it is universally known.

Let

Let us consider then how Pressure is applied to it.

Collars and *Neck-Laces* are the most common Means of compressing the Neck. But they are confined almost exclusively to the Ladies, as Stocks and Neck-Handkerchiefs are to the Gentlemen. I have seen Collars and Neck-Laces so tight around a beautiful Neck, that after occasioning much Pain, they were necessarily, though reluctantly, torn off and thrown away. I have three Times in my Life seen them so tight as to break while the Ladies who wore them were dancing.

The Position of a Collar, or Neck-Lace, as I observe it, if it consist of only a single Strip of Velvet-Ribbon, or of any similar Thing, is exactly against the Head of the Wind-Pipe, or, to speak technically, against that obtuse Angle situated in the fore Part of the Neck, and formed by the Union of the two quadrangular *Laminae* of the thyroide Cartilage. It is strange my Reader may think, that Ladies should have so great an Aversion to this Part, which is seldom so prominent in them
as

as in Men, in whom we are used to call it *Pomum Adami*. But it is stranger that few Ladies relish this *Pomum*; and that the Collar and Neck-Lace of which I now speak, are put on to compress, to lessen, and to hide it. Yet I have it on their own Authority that it is an uncomely and ungraceful Projection, and that it ought to be hidden.

The Position of the Collar or Neck-Lace, if it consists of two Strips of Velvet-Ribbon, or of two Rows of Beads, is such that one is made to encircle the Neck tightly a little above the thyroide Cartilage, and the other, or others, to hang loose below it. If there be two, or more Rows below the Cartilage, they hang one under another: an Arrangement which sufficiently proves the Intention of rendering the Eminence less conspicuous.

Stocks buckled tight, and Neck Handkerchiefs containing a *Stiffener*, as it is called, are worn only by the Gentlemen. A Lady never wears them unless she rides, and not always even then. Indeed, the former are almost entirely left off, except by old Men, and such as are required to appear

appear big and grave by the Importance of their Function: and the latter being generally made of Muslin, and tied in a loose Knot, can seldom be productive of any Inconvenience or Pain.

Now Collars, Neck-Cloths, Neck Handkerchiefs, Stocks, &c. but especially the first, if too tight, are extremely dangerous. They render Swallowing difficult, because they compress the *Oesophagus*, and they may induce Giddiness, *Stupor*, and Apoplexy. Doctor Fothergill mentions as an exciting Cause of Apoplexy looking backwards for some Time without turning the whole Body. He says—"I believe that many Persons have dropped down in apoplectic Fits merely from this unheeded Cause:"—and he rightly explains it, by observing that if the Neck be short and thick, a Twist of it so far, lessens the Diameters of the jugular Veins that it is impossible for them to return a proportional Quantity of Blood.—As to this Effect, it is the same whether the jugular Veins be twisted, or compressed. But Compression may cause
Apoplexy

Apoplexy in those whose Necks are not short, and in whom a Twist considerable both in Degree and Duration would not even induce Giddiness.

§ 11.

THE Effects of Pressure on the superior and inferior Extremities being now generally mentioned, they shall next be related particularly, agreeable to my original Plan.

A. If the Artery or Arteries carrying Blood to a Limb be compressed, a *Wasting* or Atrophy of the Limb follows. This is known to every one.—But Gottsched, in his *Dissertatio de Motu Musculorum*, and Schulzius, in his *de Elastatatis Effectibus*, say that Sense and Motion are likewise lost in Consequence of such Compression. Here, if my Reader will suffer me to digress, is a new Field to be illumined by Discussion. We all agree that an Injury done to the Brain, or *Medulla oblongata*, or to any particular Nerve, generally produces a Disease of the animal and more

I particularly

particularly of the Vital Functions. We all agree that a Nerve separated from the Brain may retain its Energy for a considerable Length of Time. But do we all agree that the Energy of the Nerves is derived from the Brain, or from the Blood-Vessels surrounding them? Doctor Monro maintains the latter Opinion, and will not allow the Brain to be, as I have been taught to think it is, exclusively the Fountain of Sense and Motion.

As for me, I differ from Monro, for various Reasons. If the *Thalami Nervorum optitorum* be pressed, does not Blindness follow? If the Origin of any Nerve be destroyed, does not its Energy perish also? And why do Nerves lose their Energy when their Origin is destroyed, if the Blood-Vessels surrounding them can afford or preserve it?

I am told that Mr. Cruickshank saw a Monster nine Months old, which lived thirty-six Hours after it was born, though it had no *Cranium*: and I have read of similar Monstrosities. But is this a Reason that we should believe the vital Functions

Functions and the Increase of the Body have no dependence on the Brain? I think not: for such acephalous Subjects never live long, and all the Experiments to be found in the Writings of Haller and Zinn, which I recollect, show that the Functions of the Nerves do depend upon the Brain.

The Circulation of the Blood is nevertheless necessary to the Influx of the nervous Energy; and the mutual and reciprocal Influence of the nervous and sanguiferous Systems upon each other, is proved by the *Phænomena* observable in both Systems, after the Application of the same noxious Powers to either of them.—It is not difficult, I say, to account for the wasting and the loss of Sense and Motion in a Limb, when the Circulation of the Blood in it is diminished or stopped.* For the Motion of the Blood being necessary to the constant and regular Influx of nervous Energy, it is manifest that Sen-

* The Reader will recollect what was said of the Back-Board. (§ 7. A.)

fation cannot long continue without it. If the nervous System be weak, the Circulation is slow at the same Time, as we observe it in old People.

It has been a Question,—whether the Blood be circulated by means of the Contractility of the Arteries, or of an Influx of nervous Energy? Now it was proved long since, that the larger Arteries are surrounded with a kind of Net-Work of soft Nerves, * as the Heart is with the cardiac *Plexus*. † But, in my humble Opinion, the Circulation of the Blood must depend more upon their muscular or irritable Power than upon the nervous Power derived from the Brain, and communicated to them by surrounding Nerves. I may say as Albinus did on a similar occasion,—“ *Experimenta indicant Integritatem Nervi requiri ut aptus sit Musculus qui secundum Naturam se moveat: ostendunt, Nervo*

* Haller, *De Nervorum in Arterias Imperio*. Goetting. 1754.

† Haller, *Nov. Comment. Soc. Scient. Goetting. Tom. II. Tab. ad Pagin. I.* also J. N. Neubaver, *Descriptio Nervor. cardiacorum*. Jen. 1772. Tab. I.

*stimulato, Fibras carneas in Convulsiones
agi. An vero ostendunt Nervorum Potestate
moveri? Excusatam velim Incredulitatem
meam. Non amo falli.**

B. If a Nerve be compressed, the Part into which it is continued becomes convulsed, paralytic, insensible, and wasted. But if the Compression be slight and of short Duration, these Effects soon go off. Thus, when we lean upon our Elbows, and press the internal Condyle of the *Os Humeri*, the Energy of the ulnar Nerve which runs through a Groove behind this Condyle is interrupted, and convulsive Twitchings of the Fingers, Inability to bend the Arm, and Numbness follow. Doctor Monro knew a Wound of the inside of the Arm succeeded by a Weakness and Wasting.†

It is doubtful whether the Nerves once divided, though they do unite, be ever capable of conveying their Energy again beyond the Place of Union. The Experiments of Monro, Fontana, Murray

* *Annot. Acad. Lib. I. Cap. XII. pag. 49.*

† *Osteology.*

and others seem to prove that they do not ; so that an Atrophy from the Division of the Nerves of a Part may be accounted incurable. Compressing the Neck has caused a Loss of Voice ;* and injuring the Muscles of the Larynx, weakens the Voice, because these Muscles receive Nerves from the recurrent Branches of the eighth Pair. Sitting so as to compress the sciatic Nerve causes a Sensation of pricking in the Thigh and Leg, disposes them to Cramp, and makes them so numb, and so weak as not to be able to support the Weight of the Body. Sitting with one Leg over the other Knee produces the same Effects in the former, and causes the popliteal Artery to beat violently. Very similar Effects therefore follow, whether an Artery or a Nerve be compressed, or divided. And the Instance of Aneurisms in the Limbs affords an additional Proof: for if the Operation for Aneurism be performed in a Limb, and the Circulation of the Blood be thereby interrupted, and not

* *Hist. de l' Acad. de Paris.* 1705.

carried on by collateral Arteries, a Lividity and Mortification will inevitably ensue.

C. If however the venous Blood be obstructed in its Return to the Heart; the Arteries being incapable of emptying themselves into the correspondent Veins, become unnaturally full and distended, and endeavour to relieve themselves by increasing the Secretion from their exhalent Extremities. Hence a Dropsy is the Consequence : the Fluid exhaled being so much that the Absorbents cannot drink it up. Besides, the Arteries being weakened more and more by Distension after the Obstruction in the venous System is made, and the Force of the Heart continuing the same, *Aneurisms* and *Varices* must necessarily arise.

In performing the Operation called *Venesection*, though it is customary carefully to prevent the Return of Blood through the Veins without stopping its Course through the Arteries, a Circumstance which is judged by the Swelling of the Veins and the Pulsation below the
Ligature,

Ligature,—I have known Patients complain of Pricking and Numbness, and have always thought it right to untie the Knot and tie it again till I could cause a Distension of the Veins without either.

I have thus considered the Blood-Vessels and Nerves together, because of their intimate Connection with each other. I have also mentioned Convulsions, Palsy, Insensibility, Wasting, Dropsy, Aneurism, and Varix as the particular Effects of Pressure on the Extremities of the Body. And, I believe, it will not be difficult to account for these Diseases from what I have advanced.

D. I might treat of the Absorbents under the Influence of Compression: but every Body who has studied their History as it is given by Cruickshank and Moscagni, who considers that their only Termination is at the Angles formed by the Union of the subcalvian and jugular Veins, and that their Distribution in the Extremities of the Body is such that one lies on each Side of the large Arteries, and that the superficial Absorbents accom-
pany

pany the cutaneous Veins, will be able to infer the Effects of Compression on them as well under the Action as the Rest of the Muscles.

E. I cannot omit to mention how much Ligatures around Muscles weaken them; and by compressing both the Arteries, Veins and Lymph-Vessels, contribute to obstruct the Course of their Contents.

F. In a former Part I only mentioned Shoes (§ 8.—D.): and it may have been thought that for the Reason there alledged I might only mention Stays too. But I now proceed to speak of them particularly.

Ladies as well as Gentlemen are frequently used from their Childhood to small Shoes; and the Effect of them is extremely obvious. They render the Bones of the Feet immoveable. Whoever looks at the Foot of an Infant and remarks how the tarsal and metatarsal Bones are moved, whoever considers how Savages whonever wear Shoes climb up Precipices, and how even in this Country Persons born without Hands have made Use of

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their

their Feet in performing feveral delicate Operations, will wonder how ingenioufly we take from ourfelves what might be fo extremely ufeful and what we can never again reftore.

Ladies only wear high-heeled Shoes. But for what Purpofe it is difficult to fay. It is certain they walk up Hill better than Men, but they cannot walk fo well upon plain Ground, nor can they walk down Hill without Danger of falling (§ 2. A.). The Mufcles inferted into the *Os Calcis* are contracted and fhortened and thofe of the Top of the Foot are elongated, diftended and weakened by high-heeled Shoes.

§ 12.

Of Compression of the Thorax and Abdomen.

A. *Stays* have been fo long in Ufe, and fo often condemned, that I cannot flatter myfelf our Ladies will be perfuaded by me to throw them afide. It has been reported that a certain Clafs of finical Gentlemen have begun to wear them: but,
for

for the Sake of the Age, I hope this Report is groundless.

Stays till the Age of fourteen are worn and laced moderately tight, as I am informed, to keep Children upright, to strengthen their Bones, to give them a proper Shape, and to correct or lessen Incurvations of the Spine: from fourteen till thirty five, and sometimes till forty, they are worn partly through Habit, but mostly to make the Waist seem small, and to hide Crookedness. After a Woman has passed her fortieth Year, she is less anxious about lacing tightly, and she prefers Ease to looking handsome.

I have frequently thought that if the original Use of Stays could be discovered,—as Men sought after the Means of supplying their Wants before they studied how to adorn their Persons,—it would be such as all Mankind might approve. I guess that they were intended in Part to conceal the Breasts, and in Part to defend them from Injuries which might disqualify them for the Secretion of Milk. It is true, Stays do not seem well suited for

these Purposes now-a-day. But the Reason is obvious : the original Use of Stays was soon forgotten after Caprice had so greatly disfigured them ; and still more forgotten after they were made to answer irrational Purposes.

B. As the Circumference of the Breasts of Women is generally as high as the inferior Margin of the second true Rib, so as precisely as I can ascertain, Stays are generall ymade to extend as high as the third true Rib, or the Space betwixt it and the second. Modest Women always take Care to hide the *Papilla*, and some still more discreet hide the whole Hemisphere of both Breasts. Indeed it is now become a Fashion to extend the Stays almost as high as the first Rib. — Stays, I believe, seldom or never reach quite so low as the umbilical Region, being in general more than two Inches above the Navel. I do not aver that this is always the Case : though that Women in England prefer long Petticoats and long Legs to short, making themselves like the Mogul Women
who

who have naturally long Legs and short Bodies, I am fully authorized to declare.

It is to please the Ladies that Gentlemen frequently make the Waist-Band of their Breeches extend far above the Navel ; this causing their Legs to appear the longer. Thus it follows, that Stays which encircle the Body, from the second or third Rib down to the End of the epigastric Region, by being made to compress much, necessarily lessen the Capacity of the *Thorax* and *Abdomen*, and not only compress the contained *Viscera*, but propel them out of their proper Situation.

C. I shall next relate how I have seen the Bones of the *Thorax* altered by Stays, and afterwards describe and illustrate those Symptoms and Diseases which such Alterations occasion by what I myself felt when I wore them only a few Minutes.

I have known the *Sternum* more than an Inch deep, the anterior Extremities of the Ribs of one Side bending over so as almost to meet the anterior Extremities of those of the opposite Side, which were bent in a similar Manner.—I have known
Instances

Instances in which the Ribs of one Side only projected forwards over the *Sternum*, proceeding almost straight from the *Vertebrae* of the Back, and giving the Appearance of a sharp Edge.—I know a Lady, at this Time, whose *Sternum* is so placed that its right Margin together with the affixed Extremities of the right Ribs is turned directly outwards; its left Margin together with the affixed Extremities of the left Ribs being turned inwards. It is a most unseemly Sight; for the right Side which is sharp projects far beyond the left. These are vulgarly called *Goose-Breasts*. They are narrower than they ought to be.—That Stays should induce such Effects can hardly be wondered at when it is recollected that at Birth the *Sternum* is cartilaginous, consisting of several Parts, and that the Ribs throughout Life are cartilaginous at their connection with the *Sternum*. For Cartilage is easily bent, and is easily made to assume various Figures.

D. A Lady did me the Favour to lace a Pair of her Stays on me,—such as are
worn

worn in the fashionable World.—She was a handsome Woman. She was tall, and, as it was agreed, well proportioned. I did not acquaint her with the Object of my Curiosity in wearing her Stays, lest she should wantonly cause me to think worse of Stays than they really are, or cunningly serving the Turn of her own Sex, cause me to think better of them. But I left her to lace them on as she was used. When she had laced them on, I wore them about ten Minutes; during which Time I put myself into a Variety of Attitudes, more particularly into those which Females are ofteneft in. Thus I endeavoured to form an Opinion of the Manner in which Stays do Harm. Where the Capacity of the Breast is greatest, there I found the Stays prefs most. And as their Pressure hindered me from making a full Inspiration, I soon felt such a Lassitude and Weight at the *Praecordia* that I thought I should have fainted before they could possibly be taken off. And even when they were taken off, and for some Time afterwards, I breathed difficultly,
felt

felt as if my Lungs had not Room enough to be dilated in, and was both extremely weak and sleepy. It is needless to explain minutely in this Place, how these Symptoms are induced. It is enough to know at present that they are induced.

E. That the Instruments by which the Breast is enlarged should be opposed, and that Breathing should be rendered difficult by Compression of the Breast, might easily have been told *à priori*. How can that *Thorax* be enlarged in Inspiration which is compressed and lessened even in Expiration?—I felt the greatest Pressure where the Ribs are naturally moved most; and it is clear to me that Women who are tightly laced, notwithstanding the Mobility of their Breasts, cannot move the intercostal Muscles at all, or cannot move them enough for a perfect Inspiration. In healthy Respiration the Diaphragm is certainly more employed than the intercostal Muscles, the Ribs, except the first, being raised upwards and outwards at the same Time: but in morbid Respiration, even the first Rib which is commonly fixed

ed and immoveable, is raised, and the inferior Margins of all the Ribs are forcibly turned upwards and outwards.

I will not venture to affirm that tight-lacing renders the Muscles which raise the Ribs immoveable. But as Compression renders Muscles immoveable in other Parts, I think it must have a Tendency at least to do so in this Part. And if I be not much deceived, I have more than a hundred Times observed Women tight-laced who were obliged after eating, dancing, &c. to employ even those Muscles to raise and dilate the Breast, which in common, vital, healthy Respiration are not employed at all: so that they breathed as laboriously as if they had been in a Fit of spasmodic *Asthma*.

Having mentioned in a former Part of this Essay (§ 7.—A.) that a Machine, called a *Back-Board*, is inimical to the Health of Children, I shall now notice how much more inimical it is when worn together with Stays; both of them forming a firmer Impediment to the easy Motion of the Bones of the Chest.

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F. But

F. But the Contents of the *Abdomen* and *Pelvis* suffer from such Pressure as much as those of the Breast. And whoever reflects on the Position of the Diaphragm, its being higher anteriorly than posteriorly the Attachment of its middle Part to the *Mediastinum*, and that only its lateral Parts lying directly under the Lungs descend in Inspiration, will readily perceive that if its Position were horizontal, the Chest could not be so much enlarged as it now can, and that the *Viscera* of the *Abdomen* would be perpetually liable to Disease from being compressed into too small a Space, and against the unyielding *Pelvis*. Hence it appears that Stays which press against the Muscles of the *Abdomen* preventing their yielding, counteract the Intention of Nature by forcing the Contents of the *Abdomen* backwards and downwards, and by obstructing the necessary Expansion of the Lungs.

Mr. White says — “ Lacing the Stays tight has been practiced not merely in conformity to the rules of fashion, but from a mistaken notion that by pressing the
children

children lower down, the mothers would have better times. This I will venture to say is one of those vulgar errors which have not the least foundation in either fact or reason. I never yet knew children lie too high. In their natural situations they are much less inconvenient to their mothers, and are carried with greater ease; to which I must add that the mothers have at least as good or better times than when they are pressed down too low, by which means the belly of the mother becomes pendulous, and the Child is troublesome to carry; the inconvenience increases too with every Child, and where the mother has had a great number, the weight at last becomes intolerable. The constant pressure of the *uterus* upon the bladder in this case occasions frequent motions to make water: an incontinence or involuntary discharge of it sometimes comes on, and it is attended with many other inconveniences."——But independent of Pregnancy, what Evils do we every Day observe in those who wear Stays? Do we not find Instances particu-

larly in fat People, of *Herniae*, *Exomphalos*, or Rupture at the Navel, in which even the Stomach, the Liver, and the Spleen are protruded? Women are indeed more subject to this Disease in the latter Months of Pregnancy. But is not the Reason obvious, the Stays pressing the *Viscera* downwards and not leaving Room for the *Uterus* to expand in? Does not Abortion often ensue from this?

§ 13.

I HAVE chosen to speak only of Stays and their Effects on the *Thorax* and *Abdomen*; because I am persuaded that from what I have said, the Effects of tight Waistcoats, &c. may easily be understood. I shall proceed therefore to treat more particularly of the Effects of Pressure on these Regions.

A. There seems to be a certain Proportion between the Size of every *Viscus* and the Diameter and Capacity of its Arteries; —and perhaps also between the Arteries, the Veins, the Absorbents and the excretory

tory Ducts. This is a Circumstance which has scarcely been taken Notice of by those who have had the greatest Opportunities of observing it: though it must be obvious even to the most superficial Reasoner that every Diminution of a *Viscus*, or of its Vessels, by Compression, or by other Means, will create in it, or dispose it to, Disease.

It may be objected to this, as it has been to *Error Loci* in Inflammation, that when a *Viscus* is so much compressed as to lessen, or obliterate the Capacity of any of its Vessels, the Fluid contained may take a retrograde Course and readily pass through *Anastomoses*. But the Force of this Objection is extenuated, if not entirely done away by recollecting that no such retrograde Course has ever been rendered visible where the Blood circulates with very great Velocity and *Momentum*, as it always does in the Lungs or where it circulates with very little Velocity as in the spermatic Arteries.

B. That an unequal Distribution of Blood and other Fluids does cause particular

cular Congestions in the *Viscera*, and consequent Inflammations, Hemorrhages, and similar Diseases, it seems to me more than probable. And I am convinced that when the Capacity of any *Viscus* is diminished, e. g. the Lungs, as the Quantity of Blood sent into them remains the same, any Thing that increases the Force of the Circulation, whether Heat, Exercise, or Passions of the Mind, may cause Inflammation, *Haemoptöe*, *Asthma*, Dropsy of the Breast and Consumption.—I am convinced from reasoning *à posteriori* that Nature intended a given Quantity of Air to come into Contact with the Blood of the Lungs at each Inspiration, and that Emaciation and Weakness supervene when this Meeting of Blood and Air is lessened or stopped:—as if the Blood lost its Power of nourishing for want of Air.

*Unâ eâdemque Viâ Sanguis Animusque sequuntur.**

C. I think the Diseases of the Liver, Inflammation, &c. to which great Eaters

* Virgil.

and

and Drinkers are so subject, proceed from the Stomach distended with Meat and Drink compressing the Liver, while the Motion of the Blood in the *Vena Portarum* is preternaturally quickened. Does not the Blood determined in larger Quantity through the iliac Vessels into the *Pelvis* and lower Limbs, when the umbilical Vessels are tied, occasion their speedy Growth and Increase? How then, the Quantity of Blood sent to a *Viscus* being the same, if the *Viscus* be lessened by Compression, can Diseases not arise?

D. Whether Ligatures around the Limbs and Trunk of the Body can so alter the Qualities of the Blood, as to produce Eruptions, &c. I am uncertain. The Experiments supposed to prove this do not appear to me conclusive. *

* *Mem. de l' Acad. des Sc. à Paris. 1740.*

C H A P. III.

Concerning the Effects of Heat and Cold.

§ 14.

GOOD Clothes, or such as are made well and of proper Materials, have the following Properties. *viz.*

A. They neither hinder by their Hardness, nor incommode by their Weight and Tightness, the free and easy Motions of the Joints.

B. They keep the Body in that Degree of Heat which is most agreeable as well as most suitable to the Functions and Actions of Health.

C. They exert no noxious Power themselves, nor are they rendered noxious by the Excretions of the Body or the Atmosphere.

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The first Quality I have already treated of as fully as the Intention of this Essay requires or admits. It is next to be inquired therefore, how by Clothes the human Body may be kept at a proper Degree of Heat.

§ 15.

A. Physicians agree that the Functions of a human Body are performed with the greatest Regularity, Ease and Pleasure when its Heat raises the Mercury to about $97^{\circ}\frac{1}{2}$ or 98° . In Fever it raises the Mercury to 105° , 106° , 107° , or 108° .—Even in the cold Fit our Heat exceeds the natural Standard by 2° or 3° . Braun found that the Heat is nearly the same in both Sexes and in every Age.*

B. All the Experiments of Doctor Crawford,† and Mr. Hunter‡ on animal Heat, tend to prove that the Powers of generating or separating Heat in Animals,

* *Novi Commentarii Academiae Scientiarum imperialis Petropolitanae. Tom. XIII. 4to.*

† Exp. and Obs on Animal Heat, &c. 2nd Edition

‡ Obs. on certain Parts of the Animal Oeconomy. page 87.

and

and consequently of generating Cold, are in a certain Proportion to each other, and to the Necessity for them. Hence, it is that in Summer and in Winter, notwithstanding the Climate, the Heat of our Bodies is almost alike.

Boerhaave thought we could not live in a Heat exceeding the natural Standard ! * But Doctor Fordyce's Experiments shew how egregiously this great Man was mistaken: he himself having borne for several Minutes an Atmosphere heated to more than 220° . without feeling either Pain or Uneasiness. †

C. As Sensations produced in us are never in Proportion to the Force of Impression, so the Sensation of Heat and Cold, which we have, is not the greater in Proportion as the Heat or Cold of the Atmosphere is the greater, but in Proportion as our Bodies are warmer or colder.

All Persons are not equally affected by Heat and Cold. This depends greatly upon the Habit of each, and greatly upon

* *Elementa Chemiae. Tom. I. pag. 277, 278.*

† Philosophical Transactions. Vol. XXV. Parts I and II.

the State of Health. For they who are by Nature delicate and irritable, or they who have rendered themselves so by warm Clothing or lying long in Bed, are subject to Dysentery, Rheumatism, Catarrh, &c. And they who have been long confined, and in whom the Blood circulates slowly, whether through Fatigue or Disease, are subject to catch Cold. —Fear, and all the depressing Passions co-operate with Cold to excite Disease.

After dancing, &c when the whole System is roused, the same alarming Effects may arise whether we take cold Water into the Stomach, or expose the Surface of the Body to a cold Atmosphere.

But going suddenly out of a very hot Atmosphere into a cold one, or out of a temperate Atmosphere into a very cold one, frequently causes no Disease at all. This seems to depend upon the same Cause as the Freezing of Animals alive: that the Excitation of the Body is too considerable to be soon and easily overcome: that the Congelation takes Place before the Powers of Life are exhausted. *

* See Hunter's Obs. on certain Parts of the Animal Economy. page 90.

The best Method of preventing the bad Effects of Cold is to clothe ourselves so as to be slowly affected by either Heat or Cold: and the best Means of counteracting them are such as increase Strength.

D. The Heat of the Surface of the Body should not be confounded with that of the internal Parts: for the Heat of the internal Parts is not so liable to be increased by Exercise, Clothing, and Changes in the Temperature of the Atmosphere as that of the external Parts.

E. Cold applied to the Surface of the Body contracts the Orifices of the superficial Vessels, propels an unusual Quantity of Blood inwards, and causes a Paleness, Dryness, and Roughness of the Skin: *Cutis asperina* as it is called. If the Degree of Cold be not greater than that of the Atmosphere sometimes in the coldest Weather of this Climate, and if the Body be vigorous and healthy, the Cold only subtracts the Excess of Heat above 98° from it, and such a Cold may justly be accounted strengthening. If, on the contrary, the Body be weak and irritable, and

Cold

Cold be applied suddenly, or if it be applied excessively and continued long, it then subtracts more Heat from the Body than what is above the natural Standard, consequently the Sensibility and Irritability will be lessened, the Spirits will be depressed, the Functions will be impaired, or totally suspended, and the Organizations will be finally destroyed.—Moderate Cold invigorates the debilitated by producing a Re-action: the living Body possessing a Power of exerting itself, when excited by Causes which tend to destroy it. And that the Exertion of this Power does strengthen the Body is evident from the Effects of bathing in cold Water: which *moderately* used has given Strength to thousands, *immoderately* Disease and Death.

Whenever the cold Bath does good, the Paleness of the Skin, and other Symptoms mentioned, are succeeded by a Warmth and Itching, a slight but general Moisture on the Surface of the Body, and an Increase of Appetite. If however, instead of these Effects the Skin remains
pale,

pale, and dry, the Body cold and insensible and Sleepiness and Head-ache, with a Diminution or Loss of Appetite succeed, we may conclude that it is hurtful, and that its Continuance is dangerous. For this is a State like the cold Fit of an Ague: a State full of Danger.—“ *Qui enim moriuntur ex Febre, five continua sit five intermittens, acuta five chronica, pereunt sub Spasmo, Frigore Horrore et Rigore Partium externarum Convulsionibus: quia Cor Pulmones et Cerebrum, Sanginine intus congesto nimium obruta, eundem ob Debilitatem amplius repellere nequeunt.*” *

F. Parts at a considerable Distance from the Heart, and in which the Blood moves slowly, e. g. the Nose and Ears, the Fingers and Toes, are subject to more Variations in their Heat than other Parts. Hence we find that when they are long exposed to Cold, the Paleness of the Skin is sooner followed by a Lividness, a Rigidity, an Effusion of Serum beneath the Cuticle, Ulcers commonly called *Chilblains*, Mortification and Death.—Cold has always a Tendency to destroy the Sensibility of
the

the Body, and consequently to destroy those Powers by which it generates Heat: the Energy of the Brain and the Motion of the Blood. It is from this that it always destroys the Sensibility of Parts before it kills them, and that Parts naturally endued with little Sensibility are such easy Victims to it.

G. I know many are of a contrary Opinion, and believe that Heat relaxes and weakens, and that Cold stimulates and invigorates. I have shown already how Cold may strengthen those who are weak by exciting the *Vis conservatrix* of the System; but the primary Action of Cold I take to be sedative. And as no Man would call Wine debilitating, because it weakens *mediately*, or by inebrating, so he should not call Cold a Stimulant and Roborant, because it strengthens *mediately*, or by causing Re-action.

§ 16.

HAVING described the Operations of Heat and Cold as concisely and plainly as
I could

I could, I shall adduce a few short Remarks on the Atmosphere, to show how Moisture and Dryness concur with Heat and Cold to influence the human Body.

A. *Moisture* and *Dryness* applied to the Atmosphere, which is always moist, * can only be considered as relative Terms.

In a *Suite* of Rooms heated by Flues in the Floor and with boiling Water, Doctor Fordyce stood only a few Minutes before Water ran down his Body in Streams.—It was not the Vapour of his Skin, but the Vapour of the Rooms condensed on his Skin, that ran down.

B. Now Condensation is a Source of Heat, as Evaporation is a Source of Cold.—Doctor Fordyce some time after this Experiment, exposed his Body to a much greater Heat, in a dry Atmosphere, and staid in it longer, without being affected nearly so much.

C. Doctor Fordyce assigns two Reasons for this: viz.

* Watson's Chemical Essays. Vol. III. p. 52.—Phil. Trans. abridged, N^o. 189.

1. That dry Air does not communicate its Heat like Air saturated with Moisture.

2. That the Evaporation from the Body which takes Place when the Air is dry assists its living Powers in producing Cold.*

• Philosophical Transactions.

CHAP.

C H A P. IV.

*Concerning woollen Clothes, the most natural,
the most wholesome.*

§ 17.

SINCE Nature always endeavours to preserve Man and other Animals at the same Temperature (§ 15.), and has given to Quadrupeds only one Kind of Covering to defend them from the Inclemencies of Season and Climate, I am inclined to believe that it was intended for Men to imitate the Covering of Brutes, and to wear only one Kind of Clothing.

The curious may inquire, why Man is not by Nature defended like Brutes with

a Coat of Hair? But it may be answered, that if Brutes had the same Reason as Man, and were of Course as capable to make a fit Clothing for themselves, they had probably been not so defended as they now are.

A. It must be acknowledged that for the Harmony of the Universe brute Animals are necessary. And as their Temperature, as well as that of Man, is nearly the same in Summer and in Winter, is it not reasonable to conclude that both are preserved of one Temperature by the same Means, and for the same Ends?

Besides, as Bears and Foxes which inhabit cold Climates can maintain the natural Temperature in all Seasons, and be in Health and Vigour, with one and the same Covering; I would ask why Man might not maintain his natural Temperature, and remain in Health and Vigour, with one and the same Covering also?

That it would be improper for Man to go naked, it needs no Proof. But as the Body of Man is beset with Hair like that of Quadrupeds, though in general neither so
long

long, nor so thick, I cannot but consider it as an Index of Nature to point out that our Covering like that of Brutes, should be made of Hair or Wool.

Nor can I imagine of what Use the Hair is on the Hands and Arms, on the Legs and Thighs, if it be not this Index. Nay, the Head of Man is thickly clothed with Hair by Nature; and if the early Fashion of ornamenting the Head had not degenerated into the Habit of wearing a Hat, I am mistaken if the Hair alone had not been found sufficient to keep our Heads warm.

B. One Objection, which my Friends have urged against this, is, that Bears, Rabbits, Hares, Foxes, and many other Animals, have not an equal Quantity of Hair in all Seasons. But admitting this Fact, it does not seriously militate against my Opinion (§ 17.), there being no Season or Climate, however warm, in which these Animals are not covered with some Hair; and it often falls off even in the coldest Seasons and Climates.—It seems natural that the old Hair should fall off to make Room for new;—that the Hair
should

should be regenerated as well as the other Parts of the Body. And the Hair being thicker in cold than in warm Climates, and in cold than in temperate Seasons, does not prove that it is unnecessary in warm Climates ;—and much less that any Thing better might be supplied. The utmost it proves is that less might suffice.

§ 18.

BEFORE however it be granted that Man should always wear the same Kind of Clothing (§ 17.), and that it in Imitation of Nature should be woollen, let us reflect on some of the Advantages which Society would derive from it. These I shall consider under the one or the other of the two following Heads. *viz*:

A. Either, as derived from its being always the same.

B. Or, as derived from its being woollen.

It may be necessary to remind my Reader that I only treat of that Covering which is worn next the Skin, and not of that
that

that which is external and merely ornamental (§ 1.).

Many speaking of Clothing, by heedlessly confounding that worn next the Skin, with that which covers it, have drawn very erroneous Inferences. They have even preferred in general Terms the whole Dress of the People called *Quakers* from its Simplicity and Neatness: a Preference which however just with Regard to the exterior Clothes, is certainly not equally so with Regard to that worn next the Skin. For Quakers wear the same Kind of Shirts and Stockings as we do: and some of them really neat, who honour me with their Acquaintance, suffer as much and are in Danger of as much from the Pressure of their Clothes as many of us.

1. The more obvious Advantages to be derived from wearing always one Kind of Covering may be easily understood from the following Considerations.

a. Uneasiness, Itching and Pain most commonly attend the Change of one Kind of Covering for another, even when there is no Suspicion of Dampness.

A Skin

A Skin used to the Feel of fine Linen cannot bear that of Course. *

A Skin used to the Feel of Linen cannot bear, with equal Pleasure, the Feel of Cotton. And Flannel which seems to me in its Effects most like the hairy Covering of Animals, is regarded with a Degree of Antipathy by those who have long accustomed their Skin to Linen or Cotton. †

b. To change our Apparel as often as the Weather changes is attended with a great Loss of Time, and supposes a fit Opportunity, and a certain Degree of Independence.

Now Time and Opportunity are seldom at the Disposal of Sailors, Soldiers, and Husbandmen. And as the Necessity of these People must always have existed;

* The Brother of *Louis XIV*, who was secluded from Society in the Bastille of Paris is reported to have worn very fine Linen, because coarse Linen made him uneasy. *Mem. du Marechal Duc de Richlieu, &c.* Ann of Austria was under a similar Necessity of wearing fine Linen.

† Sir Benj. Thompson says there is no Luxury greater than that of wearing Flannel, when one is used to it. *Phil. Transf. Vol. 77. Part II. p. 240.*

it does not seem likely that such a Covering should have been intended for them by our all-wise Creator as they have neither Ability nor Opportunity to wear.

Consider the Dormouse: it is so clothed with Hair, which slowly communicates Heat, that Mr. Hunter could not freeze it even in a freezing Mixture, till he had thoroughly wetted its Hair. * And if such a Reptile as this, so low a Link in the Chain of Existence, is qualified by a Covering of Hair to maintain a similar Degree of Heat in all Seasons and Climates; will my Reader believe that Man might not also more effectually brave Inclemencies of Weather if he had such a Covering?

I hold the Practice of wrapping ourselves up in Flannel at the Approach of Winter, changing it for Calico at the Approach of Spring and Autumn, and wearing Linen only during the Summer, to be equally absurd and hurtful. I make no Doubt but many have fallen Martyrs

* Obs. on certain Parts of the animal Oeconomy p. 89.

to it. For it prevails equally among the strong and the weak, those of thirty and those of sixty. Besides, the Temperature is seldom the Signal for these Changes, it is the Day of the Month!

I aver that, as no Man can certainly fortell what Covering may be most suitable for to-morrow, so if he could, the States of the Weather are too inconstant and various for him to possess a Covering proper for every possible one. I am hurt when People in Ease and Affluence tell me that Clothes should be changed as often as the Weather changes: just as if they had only the Care of themselves at Heart. For Poverty will always preclude the labouring Poor from the Advantages of so frequent a Change, provided it be ever so necessary.

2. The principal Advantages to be derived from a woollen Covering next the Skin may be understood from the subsequent Reflexions.

How slowly a Covering of Wool transmits Heat, I have already observed in speaking of the Dormouse. And the same
Experiments

Experiments to which I then alluded, supply us with an unexceptional Proof that linen and cotton Shirts and Stockings subject us to more debilitating Heats and more fatal Colds than flannel.

In confuting old Opinions for the Sake of establishing new, we are generally in the same Predicament as they who pull down old Houses to erect new in their Places. We get no Praise for the first Part of our Labour, that of removing the old; nor is it till we have cleared away huge Masses of Rubbish and established a Foundation, that we gain the Attention and Respect of Mankind.

The Dormouse could not be frozen even in Mr. Hunter's freezing Mixture till its Hair was thoroughly wetted (§ 18.—B.): and it froze afterwards as soon as if it had not been covered with any Hair. The Reason can be no other than this, that Water communicates Heat quicker than Hair. In other Words, the Heat of the Dormouse was so slowly communicated by its Hair to the Atmosphere, that its living Powers being rouzed at the Approach

proach of the freezing Mixture were capable of generating or extricating more Heat as fast as the Hair conveyed any away. Every one knows how slowly Wool attracts Water: and it is proved by the most simple and satisfactory Experiments that—"Bodies which are the most easily wet, or which receive Water in its unelastic Form with the greatest ease, are not those which in all cases attract the watery vapour dissolved in the air with the greatest force. *

But why should a Covering of Hair, or Flannel, communicate Heat from the Atmosphere to our Bodies sooner than from our Bodies to the Atmosphere? The Fact is, it does not.

Thus far, I think, we have Reason and Analogy in our Favour. Let us next enquire how they felt Flannel who wore it in hot Climates. I know no Authority better than that of Sir Benjamin Thompson.—"It is a mistaken notion, says he, that it is too warm a cloathing for summer.

* Philosophical Transactions. Vol. 77. Part II page 244.

I have

I have worn it in the hottest climates, and in all seasons of the year, and never found the least inconvenience from it,"*—And I can aver that I have worn it several Years, in Summer as well as Winter, in the warmest Rooms, and under the most fatiguing Exertions, without ever feeling the least Inconvenience. Nay, since I have worn it, I have never once felt any Complaint in my Breast, which I frequently did before. In short, since I have worn it, I have never experienced an Hour's Ailment.

But why is Linen and Calico preferred to Flannel? I am told, it is because Flannel heats more than Linen or Cotton. Now, it must be allowed it is not the Heat of our Covering that is ever disagreeable to us, but its being soaked in Sweat and confined next the Skin. Did my Reader ever feel uncomfortable from mere Heat? No: he could not. He can only have felt uncomfortable from his wet Shirt sticking to his Skin.

* Philosophical Transactions Vol. 77.

I prefer

I prefer Flannel to Linen, because with the former I can perspire without Danger, and exercise myself without any unpleasurable Feeling. But who can do so, when Linen is next his Skin?—If one dances with Flannel next the Skin, the Perspiration is necessarily encreased, the Matter perspired is conveyed through the Flannel to the Atmosphere, and the Skin remains dry, warm, and comfortable. If one dances with Linen next the Skin, the Perspiration is also necessarily encreased, but the Matter perspired is not conveyed through the Flannel to the Atmosphere: much of it being condensed into a Fluid State, retained in the Linen, and kept in Contact with the Skin. Here then there are two Sources of Heat which those who wear Flannel next the Skin are never subject to: these are 1. the Condensation of the Vapour of the Skin, all Vapours in becoming fluid and all Fluids in becoming solid giving out Heat, and 2. the greater Capacity of Linen for Heat.

Suppose, again, that after dancing and perspiring greatly, Necessity obliges me to

go into the open Air. I have done it many Times with Flannel next my Skin; but I never caught Cold by it, nor did I feel uncomfortably warm. And doubtless the Reason is because my Skin was kept dry by the Flannel conveying away the Matter perspired before it lost its Form of Vapour. Suppose after dancing and perspiring freely, Necessity should oblige one with Linen next his Skin to go suddenly into the cold Air: what will be his Sensations! what his Risque! His Linen will be soaked in Sweat, and like every Thing excrementitious disgustingly stinking, he will feel cold and shiver, his Teeth will chatter, and it is a Thousand to one but he catch Cold,—a Hundred to one but his Lungs become inflamed. For he is subject to a Source of Cold, which those who wear Flannel next the Skin seldom or never are: this is the Evaporation of the condensed Fluid from their Linen, which will be greater in Proportion as it is exposed to the more Wind.

C. Thus it appears how effectually a Covering of Wool can defend our Bodies from

from sudden and excessive Heat and Cold, how exactly it co-operates with the Powers of generating Heat and Cold in living Systems (§. 15.), and how constantly it preserves us in that Temperature which is most pleasurable as well as most natural and beneficial.

D. As to the Benefits derived from Flannel as an *electric*, I cannot conveniently enlarge on them *. It must suffice, at present, to have proved that Heat and Dryness are necessary to Perspiration; † and that our Clothes never feel so pleasant as when the Matter perspired and the Evaporation from our Clothes are in such a given *Ratio* to each other as to preserve us dry.

§ 19.

I SHALL now recite the most common Objections, which People make to Flannel: I shall at least recite all I know.

* Brydone's Tour through Sicily, &c.

† See Home's Med. Facts and Experiments. p. 245.

A. It is said that Flannel always *weakens*, but especially when worn next the Skin. This is the first Objection; and a more ungrounded one there cannot be. It is said Flannel weakens by causing too great a Perspiration; and hence some People avoid it as they would swallowing a large Dose of Dover's Powder. Yet I never heard or read of a Physician who taught or believed that a dry Skin and a free Perspiration, such as Flannel is known to occasion, ever do Harm.—“ In Egypt during the second Part of the Summer, every one sweats profusely several Times a Day, and at that Season the Inhabitants always enjoy the most perfect Health.—” *

But every Man who has worn Flannel any Length of Time knows that it neither heats him more than Linen, nor subjects him to a more copious Perspiration after Exercise. I speak from Experience, and it is proved by Analogy and Demonstration.

* Glafs. Comment. de Feb.—Comment. X. De Sudorum Evocatione. Prosper Alpinus de Med. Ægyptiorum. Lib. 1. Cap. XVIII.

If, indeed, Flannel made us sweat, it might then do Harm: but by only making us perspire it is one of the most effectual Means of doing us good.

Such absurd Notions as these are generally propagated by the rheumatic, the gouty, and the infirm, who are disposed to sweat in Consequence of their Disease, but who know not how to distinguish between the Effects of the Disease and those of their Flannel.

B. Flannel is also said to excite an *Itching*: but this Objection may be made to Linen. For it is clear that neither fine Flannel nor fine Linen causes it. Nay, even coarse Linen and coarse Flannel only cause it for a Time.

C. It is natural enough for Persons to rub and scratch themselves who feel any Itching; and that the Skin should of Course be inflamed, it is easy to suppose. But they who are prejudiced against Flannel, say that Flannel alone may cause an *Eruption*. Now if it ever did this, the Objection would be a very serious one. But I deny that it ever can.

D. There

D. There still remains another Objection to be mentioned. It is that Flannel disposes Persons to the *phlegmas* of the Greeks, the *Morbus pedicularis*, or *Pediculatio* of the Latins. This Objection, however, can only be seriously made by those who wish one Flannel Waistcoat to serve for many Months. I do not think it worth while to remove such an Objection as this : but if my Reader will follow my Example, and change his flannel Waistcoat as often as he changes his Shirt, I am certain he will find Flannel far more sweet and comfortable than Linen.

§ 19.

I SHALL conclude this Essay with a Remark on the Custom of wearing cotton Stockings, and a Proposal for the delicate and invalid to alter the Form of their Stockings in general.

A. *Cotton Stockings* are more generally worn by the Ladies than any. It is a custom however which I know to be equally pernicious and filthy.

a. It is proved to be pernicious thus. There is not a greater and more important Emunctory in the whole human System than the Feet. The Connection between the Feet and the Head, the Stomach, the *Uterus* and the urinary Passages is such that I, and very many besides me must, have seen a Fit of the Gout, a Suppression of the *Menses*, and Pains resembling those of the Stone almost instantaneously brought on by Cold applied to the Feet. I am even persuaded that Cancer, Inflammation, and even Abortion are frequently occasioned by wearing cotton and filken Stockings.

Cotton like Linen once saturated with the Moisture discharged from the Feet, can receive no more: and as it can part with little or none at all to the Atmosphere, the Excretion must be more or less impeded, and a Sense of Coldness and Clamminess must be inevitable. Nothing stops the Excretion from the Feet sooner and more effectually than Cold.

b. Nor are Facts wanting to convince those who are open to Conviction that Cotton worn next the Skin is a plentiful
Source

Source of Uncleanliness. Let any one desirous to see it proved wear cotton Stockings one Day and worsted the next, and afterwards lay which was the more free from Humidity and Smell. I have tried the Experiment often, and always with the same Result. Cotton saturated with the Sweat of the Feet,—and Cotton can contain more than Linen,—soon rots. Cotton Stockings will not last nearly so long as worsted for this very Reason.

Mankind seem as yet ignorant of the Calamities which may arise from the spontaneous Changes which the Sweat of the Feet stagnating in the Stockings undergoes: of the Calamities which may arise from the mutual Action of the Sweat and the Leather and its Impregnations. In short they who wear cotton Stockings ought from Regard to Delicacy as well as Health to change them once a Day even if they fit still: and if they walk about.—as Motion encreases Perspiration, — twice or oftener.

It is unnecessary to speak of filken Stockings: for they are so thin, and such easy Conductors

Conductors of Heat, that they are never worn alone by prudent People, but over worsted or yarn. I have no great Objection to this Custom.

B. The last part of my Essay contains a Proposal for Stockings to be made with Toes, as Gloves are with Fingers. A Proposal so strange is not expected to meet the Approbation of those who are biased by Prejudice, and who rather consider the Custom than the Comfort of Things. But, it is hoped, all Persons who honour the present Essay with their Attention, will not dislike any Objection, merely because it is an Objection; but regard it with Sedulity and Candour, as it so intimately concerns the Welfare of Mankind.

1. Although the Feet are as great and important an Emunctory as any in the human Body, yet it has never been proposed, as I know to solicit the Discharge from them. On the contrary, it has been repeated as a Rule, particularly in the polite World, that suppressing their Discharge is the most certain and effectual Method of keeping them dry and free from
Smell

Smell. Hence, old Women have set about suppressing the Discharge, and an unsuspected Fatality must often have overtaken the unwary who confided in their anile Injunctions.

a. I agree that dry Feet are preferable to moist : but I assert that those Means which encrease their Perspiration are the only which can possibly preserve them dry, and prevent their smelling offensively.

Whether the Vapour perspired from the Feet be like that from other Parts of the Body, as I do not know that it comes but from the exhalent Arteries which open on their Surface, I cannot determine; though I am convinced that the Necessity of Perspiration in some Parts of the Body is far more indispensable than in others. Perhaps, a Diminution or Suspension of Perspiration in other Parts is more readily compensated by an Increase of Urine than in the Feet.

No one can seriously doubt the Importance of a free Perspiration from the Feet. Keeping them in warm Water has frequently removed Pains and even Inflammations

mations of very distant Parts: and a copious Discharge from them has in all such Cases been known to precede the Cure. So that if the Pain and Inflammation were not caused by Suspension of the perspiring Faculty of the Feet, they were at least certainly cured by exciting or increasing it.

b. By what change of Clothing then are the Feet to be kept dry and free from Smell. When we run, and when we dance, do not our Feet perspire much, and do not the Feet of some become clammy and offensive after such Exercises, within a short Time, notwithstanding all their Endeavours to prevent it?—Now, all this is easily enough answered. In Fact, I have answered it fully already. But, I will answer it again in a summary Way.—I have shown that our Body perspires most when it is driest, and that it is preserved dry by wearing such a Covering as conveys away the Vapour perspired before it has Time to condense into a fluid Form. Lastly, I have shown that such a Covering must be woollen. Therefore, if Persons
wearing

wearing Cotton, thread, or filken Stockings do feel a Coldness and Clamminess, and if their Feet do exhale a disagreeable Smell; I say it is because their Stockings instead of conveying the Vapour perspired away before it changes its Form, absorb and retain it in Contact with the Skin, in a Heat most favourable to Putrefaction, and thus obstruct all future Perspiration.

I do not however believe that our Feet are as easily kept dry as our Bodies. For the Vapour of the Skin after passing through even worsted Stockings must in some Measure be secluded from the Atmosphere by the Leather of the Shoes. Be this as it may, worsted Stockings convey the Vapour from the Feet, and do not readily retain it condensed: so that if the Vapour only assume a fluid State, on the Outside of the Stockings, between them and the Shoes, we are at least more likely to feel less Coldness and Clamminess than if we wore Stockings which more readily absorb Water than Vapour.

But the most disagreeable Sensation which they ever feel, whose Feet sweat,

Q

is

is between the Toes. Here it is that the more fluid Part of the Sweat being absorbed, leaves the gross and glutinous Part to accumulate and putrefy. This I think can only be prevented by presenting even to the Skin between the Toes a woollen Covering; in other Words, by making our Stockings with Toes, as we do our Gloves with Fingers.

F I N I S.



